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			<div>EXAMINER</div> <div>OH, TAYLOR V</div>	
			<div>ART UNIT</div> <div>1625</div>	<div>PAPER NUMBER</div>
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary

Application No.

10/771,640

Applicant(s)

WHITE, JAMES FERGUSON

Examiner

Taylor Victor Oh

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 25 September 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 17-39 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 17-39 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 04 February 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date: _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>2/24/04</u> . | 6) <input type="checkbox"/> Other: _____ |

Non-Final Rejection

The Status of Claims :

Claims 17-39 are pending.

Claims 17-39 are rejected.

DETAILED ACTION

Priority

1. It is noted that this application is a division of 10/036,822 (12/21/01) (US 6,706,658).

Drawings

2. The drawings filed on 02/04/2004 are accepted by the examiner.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 17-25, 29, 31,33-34, and 36-39 are rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for using platinum, platinum and rhenium,

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platinum and ruthenium, platinum and tungsten, platinum and nickel, platinum and tin, platinum and iron, platinum and copper, platinum and rhodium, platinum and lead, platinum and germanium, palladium, palladium and rhenium, platinum and gold, platinum and tellurium, palladium and gold, palladium and indium, palladium and sulfur, palladium and tellurium, palladium and rhodium, palladium and tungsten, palladium and nickel, palladium and tin, palladium and copper, palladium and ruthenium, palladium and lead, palladium and germanium, cobalt, rhodium, ruthenium, osmium, and iridium.

as the metal catalyst, does not reasonably provide enablement for using any metal catalysts generally. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to include all kinds of metal catalysts unrelated to the claimed invention commensurate in scope with these claims.

Furthermore, the instant specification fails to provide information that would allow the skilled artisan to practice the instant invention without **undue experimentation**. Attention is directed to *In re Wands*, 8 USPQ2d 1400 (CAFC 1988) at 1404 where the court set forth the eight factors to consider when assessing if a disclosure would have required undue experimentation, citing *Ex Parte Forman*, 230 USPQ 546 (BdApls 1986) at 547 the court recited eight factors:

- 1) the quantity of experimentation necessary,
- 2) the amount of direction or guidance provided,
- 3) the presence or absence of working examples,
- 4) the nature of the invention,
- 5) the state of the prior art,
- 6) the relative skill of those in the art,
- 7) the predictability of the art, and

8) the breath of the claims.

The Nature of the Invention

The nature of the invention in claim 17 is described below:

17. (original) A method of purifying a crude polycarboxylic aromatic acid composition, comprising:

contacting the crude polycarboxylic aromatic acid composition with a catalyst composite comprising

an extruded activated carbonaceous material comprising a first set of pores having a pore diameter of at least about 40 Å and at most about 100 Å with a porosity of at least about 0.15 cc/g, and a second set of pores having a pore diameter of at least about 5,000 Å and at most about 20,000 Å with a porosity of at least about 0.3 cc/g; and

a metal catalyst.

The State of the Prior Art

The states of the prior art are described as followed:

Morikawa et al (EP 0347830) discloses the following summary:

Ⓒ A process for producing 1,1,1,2-tetrafluoroethane, which comprises reacting 2,2-dichloro-1,1,1,2-tetrafluoroethane, 2 chloro-1,1,1,2-tetrafluoroethane or a mixture thereof with hydrogen in the presence of a hydrogenation catalyst consisting essentially of a Group VIII element as the main component and at least one element selected from the group consisting of Group IB elements, lanthanum and lanthanide elements, as an additional component.

Konishi et al (WO 01/21306) discloses the following summary:

(57) Abstract: A catalyst for the hydrogenation of carboxylic acids which comprises activated carbon having deposited thereon active metals including ruthenium and tin, characterized in that the activated carbon is one produced by a process comprising activating a carbonaceous material with zinc chloride and then burning it; a catalyst for the hydrogenation of carboxylic acids which comprises activated carbon having deposited thereon active metals including ruthenium and tin, characterized in that the activated carbon, before deposition of the active metals, had specific pore properties, in particular, such properties that the volume of pores having a pore radius not smaller than 10 Å but not larger than 100 Å was from 0.5 to 2.0 cm³/g; and a process for producing a primary alcohol which comprises reacting at least one starting material selected from the group consisting of carboxylic acids and acid anhydrides with hydrogen gas in the presence of water and either of the catalysts to hydrogenate the starting material

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Romanenko et al (WO 01/087798) discloses the following summary:

(57) Abstract: The invention relates to catalytic compositions from metals of group VIII, used for purification of terephthalic acid, to methods of preparing such compositions and to a process of purification of terephthalic acid. The invention allows for creating stable and selective catalysts used in the process of purification of terephthalic acid. The catalytic composition comprises crystalline particles of palladium or catalytically active palladium and of at least one metal of group VIII of the periodic table, whereby said elements are deposited on the surface of a carbonated matter. The carbonated matter represents a mesoporous graphite-like material, whereby the size of pores thereof is comprised between 40 and 400 Å, the proportion of pores in the total volume is at least 0.5 and the degree of similarity thereof to graphite is at least 20 %. The crystalline particles of the metals are distributed across the volume of the granules of said carbonated matter such that the maxima of distribution of the active components of the granule are separated from the external surface of the granule by a distance equal to 1-30 % of the radius of the granules. The inventive catalytic composition comprises crystalline particles of palladium and rhodium or of palladium and ruthenium or else of palladium and platinum, whereby the total metal content may vary between 0.1 and 3.0 wt.%, and the ratio of palladium to other metals may vary between 0.1 and 10.0,

As the prior art have been discussed in the above, there is no conclusive data that all kinds of metal catalysts would be required to produce the final desired product except some metal hydrogenation catalyst, palladium, platinum, rhodium, ruthenium, tin.

The predictability or lack thereof in the art

In the instant case, the instant claimed invention is highly unpredictable since one skilled in the art would recognize that not every metal catalyst would work on the claimed process in the same way as do those metal catalysts such as platinum, platinum and rhenium,

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platinum and ruthenium, platinum and tungsten, platinum and nickel, platinum and tin, platinum and iron, platinum and copper, platinum and rhodium, platinum and lead, platinum and germanium, palladium, palladium and rhenium, platinum and gold, platinum and tellurium, palladium and gold, palladium and indium, palladium and sulfur, palladium and tellurium, palladium and rhodium, palladium and tungsten, palladium and nickel, palladium and tin, palladium and copper, palladium and ruthenium, palladium and lead, palladium and germanium, cobalt, rhodium, ruthenium, osmium, and iridium.

Furthermore, the specification of the claimed invention does support the very idea of the unpredictable aspect of the catalysts by disclosing those specific and workable metal catalysts (see page 17, lines 18-28) for the metal hydrogenation catalyst in the above, not that all kinds of the metal catalyst known in the art will work.

Moreover, chemical reactions are well-known to be unpredictable, *In re Marzocchi*, 169 USPQ 367, *In re Fisher*, 166 USPQ 18. Additionally, catalytic processes, such as are present here, are inherently unpredictable. The U.S. District Court District of Connecticut held in *MOBIL OIL CORPORATION v. W.R. GRACE & COMPANY*, 180 USPQ 418 that "there is an inherent mystery surrounding the unpredictability of the performance of catalysts; a mystery which is generally recognized and acknowledged by chemists in the cracking art. This is one more reason why the presumption of patent validity "should not be disregarded especially in a case of this sort where the intricate questions of [bio]chemistry involved are peculiarly within the particular competence of the experts of the Patent Office." *Merck & Co. v. Olin Mathieson Chemical Corp.*, 253 F.2d 156, 164, 116 USPQ 484, 490 (4th Cir. 1958)". "The catalytic action can not be forecast by its chemical composition, for such action is not understood and is not known except by actual test, *Corona Cord Tire Co. v. Dovan*

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Chemical Corp., 276 U.S. 358, 368-369 (1928). Also see, *Application of Grant*, 304 F.2d 676, 679, 134 USPQ 248, 250-251 (CCPA 1962); *Rich Products Corp. v. Mitchell Foods, Inc.*, 357 F.2d 176, 181, 148 USPQ 522, 525-526 (2d Cir. 1966), cert. denied 385 U.S. 821, 151 USPQ 757 (1966); *Ling-Temco-Vought, Inc. v. Kollsman Instrument Corp.*, 372 F.2d 263, 268, 152 USPQ 446, 450-451 (2d Cir. 1967); *Georgia-Pacific Corp. v. United States Plywood Corp.*, 258 F.2d 124, 132-133, 118 USPQ 122, 128-129."

Therefore, from the above, it is clear that the use of every generic "metal catalyst" will not form the desired claimed product in a good yield.

The amount of direction or guidance present

The direction present in the instant specification is that not any metal catalyst can be led to the formation of the desired product. According to the specification, it is silent as to how any metal catalyst can be led to the formation of the desired product and fails to provide guidance as to whether any acidic catalyst is sufficient enough to allow to form the desired product in sufficient quantities; the specification fails to provide a correlation between the claimed process of the invention and the functional language of any metal catalyst.

The presence or absence of working examples

In the instant case, the claim encompasses all the various metal catalysts. Applicants' specification provides no particular exemplified catalyst compound shown in the example for producing the desired compound in the specification. There is not even

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single representative for all the metal catalysts which would work for the claimed process. Thus, the specification fails to provide enough working examples as to how all types of metal catalysts can be resulted in the claimed products, i.e. again, there is no correlation between the functional language of any metal catalyst and the desired final product.

The breadth of the claims

The breadth of the claims is that any metal catalyst would work on the claimed process in the same way as those disclosed catalyst in the specification without considering the affect or impact of the different types of metal catalysts on the reactants.

The quantity of experimentation needed

The quantity of experimentation needed is large. One of skill in the art would need to determine which one of the metal catalysts would be capable of forming the desired product and would furthermore then have to determine which one of the metal catalysts would not be resulted in the claimed desired compounds in a sufficient quantity.

The level of the skill in the art

Even though the level of skill in the art of hydrogenation process is high, the skilled artisan employing this process would be a BS Chemist working in a laboratory facility. He would know how to use the taught metal catalyst, but not how to select other catalyst without trial and error.

Therefore, in view of the Wands factors and *In re Fisher* (CCPA 1970) discussed above, to practice the claimed invention herein, a person of skill in the art would have to engage in undue experimentation to test which metal catalyst can be employed to produce the desired claimed compound encompassed in the instant claims, with no assurance of success.

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 17-39 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claims 17, 21, 25, 33 and 39, the phrase "at least about" is recited. This expression is vague and indefinite because the specification does not point out what is meant by the phrase "at least about". The mere reciting those terms is invalid as indicated in the MPEP:

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A. "About"

The term "about" used to define the area of the lower end of a mold as between 25 to about 45% of the mold entrance was held to be clear, but flexible. *Ex parte Eastwood*,

163 USPQ 316 (Bd. App. 1968). Similarly, in *W.L. Gore & Associates, Inc. v. Garlock, Inc.*, 721 F.2d 1540, 220 USPQ 303 (Fed. Cir. 1983), the court held that a limitation defining the stretch rate of a plastic as "exceeding about 10% per second" is definite because infringement could clearly be assessed through the use of a stopwatch.

However, the court held that claims reciting "at least about" were invalid for indefiniteness where there was close prior art and there was nothing in the specification, prosecution history, or the prior art to provide any indication as to what range of specific activity is covered by the term "about." *Amgen, Inc. v. Chugai Pharmaceutical Co.*, 927 F.2d 1200, 18 USPQ2d 1016 (Fed. Cir. 1991).

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

Claims 17-39 are rejected under 35 U.S.C. 102(a) as being anticipated clearly by Romanenko et al (WO 01/087798), which is equivalent to Romanenko et al (EP 1205241).

Romanenko et al (EP 1205241) discloses the following abstract:

(57) Abstract: The invention relates to catalytic compositions from metals of group VIII, used for purification of terephthalic acid, to methods of preparing such compositions and to a process of purification of terephthalic acid. The invention allows for creating stable and selective catalysts used in the process of purification of terephthalic acid. The catalytic composition comprises crystalline particles of palladium or catalytically active palladium and of at least one metal of group VIII of the periodic table, whereby said elements are deposited on the surface of a carbonated matter. The carbonated matter represents a mesoporous graphite-like material, whereby the size of pores thereof is comprised between 40 and 400 Å, the proportion of pores in the total volume is at least 0.5 and the degree of similarity thereof to graphite is at least 20 %. The crystalline particles of the metals are distributed across the volume of the granules of said carbonated matter such that the maxima of distribution of the active components of the granule are separated from the external surface of the granule by a distance equal to 1-30 % of the radius of the granules. The inventive catalytic composition comprises crystalline particles of palladium and rhodium or of palladium and ruthenium or else of palladium and platinum, whereby the total metal content may vary between 0.1 and 3.0 wt.%, and the ratio of palladium to other metals may vary between 0.1 and 10.0,

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Example 3.

[0030] The catalyst is prepared by combined application of Ru and Pd, using aqueous solutions of RuOHCl_3 and H_2PdCl_4 as metal precursors, respectively. For this purpose, a cylindrical rotated reactor is charged with 50 g of Sibunit 1 carbon carrier. 13 ml of an aqueous solution of Na_2CO_3 (0.371 mole/l) and 13 ml of H_2PdCl_4 (0.109 mole/l) + RuOHCl_3 (0.076 mole/l) are fed to a nozzle with the same space velocity (2.5 ml/min) in the molar ratio Na_2CO_3 : (Ru+Pd) = 2:1, and the resulting mixture is sprayed into the reactor. The catalyst is discharged and dried under vacuum at 70°C to constant weight. The subsequent operations of reducing, washing and drying are similar to Example 1. The resulting product is a (Ru-Pd)/Sib.1 catalyst containing 0.2 percent by weight of ruthenium and 0.3 percent by weight of palladium.

(see page 5 , example 3).

Example 38.

[0069] The method of purifying terephthalic acid is similar to that described in Example 36, the difference being in that the purification is carried out on the catalysts prepared as described in Examples 3 and 34 with an increased initial content of p-carboxybenzaldehyde, equal to 30,000 ppm.

[0070] The analytic data on the quality of terephthalic acid purified by this method are presented in Table 5.

(see page 9, example 38).

Example 39.

[0071] 500 ml of distilled H_2O , 25 g of impure terephthalic acid containing 3552 ppm of 126 ppm of p-toluic acid are charged into a 750 ml stainless steel cylinder (solvent). After that the autoclave cover is put onto the cylinder and screwed down tightly. 2.0 g of the catalyst prepared as described in Example 1 are placed on a grid of a reactor comprising a stainless steel tube with an inner diameter of 10 mm, having a drain opening at the height of 110 mm from a lower grid, and fixed from the top with the second grid. The reactor is coupled to the solvent. The drain opening of the reactor via a thermostated steel capillary is tightly coupled to a crystallizer which comprises stainless steel autoclave having a capacity of 750 ml. The solvent, reactor and crystallizer are disposed in a heated temperature-controlled cabinet. The system is purged with nitrogen, then with hydrogen, H_2 being bubbled through the aqueous suspension of terephthalic acid in the solvent, and the pressure is brought up to 10 atm with hydrogen. On the control panel the temperature is set to be 250°C, and heating of the temperature-controlled cabinet is switched on. As soon

as the temperature in the system reaches the prescribed value, hydrogen is supplied to the solvent with a constant space velocity by means of a gas flow regulator. Constant pressure in the system is maintained by keeping a pressure regulator disposed at the crystallizer outlet in "pulled back" position. As the gas gradually enters the system, it displaces the terephthalic acid solution from the solvent into the reactor, and the terephthalic acid solution is forced with a constant velocity through the catalyst bed from bottom upwards and drained through the drain opening into the crystallizer. Forcing the solution through the reactor takes 8 hours. The reaction mass is cooled down, and the setup is purged with nitrogen. The contents of the crystallizer (terephthalic acid suspension in water) are transferred to a glass filter, filtered, washed with distilled water (100 ml), and dried under vacuum at 75°C for 2 hours. From the powder of terephthalic acid thus obtained samples are taken for impurity analysis.

(see pages 9-10 ,example 39).

Table 1. Main characteristics of some granulated porous carbon materials

Nos.	Grade	Origin (source)	Appearance	Size, mm	A_{BET}^{11} , m^2/g	V_{micro}^{21} , cm^3/g	V_{meso}^{31} , cm^3/g	V_L^{41} , cm^3/g	V_{meso}/V_L	D_{mean}^{51} , Å	K^6 , %
1	AR-B	Coal	Rod-like	4-5	438	0.192	0.027	0.219	0.12	20	5
2	CG-5	Coconut carbon	Crushed	3-6	1024	0.438	0.047	0.485	0.10	19	10
3	L-2702	Coal	Rod-like	4-8	1024	0.453	0.046	0.499	0.03	19	
4	FB-4	Coal	Rod-like	4-6	606	0.222	0.144	0.366	0.39	24	
5	KVU-1	Hydrocarbons	Granule	3-5	120	0.010	0.310	0.32	0.97	107	40
6	Sibunit 1	Hydrocarbons	Granule	2-3	440	0.015	0.665	0.680	0.98	62	60

¹¹ A_{BET} (m^2/g) is the specific surface area according to BET. The surface area was calculated within the isotherm region where $P/P_0 = 0.05-0.20$; the value of the nitrogen molecule area in the filled monomolecular layer was assumed to be equal to $\omega = 0.162 \text{ nm}^2$.

²¹ V_{micro} (cm^3/g) is the volume of micropores. It was calculated, using comparative method within isotherm regions corresponding to the region between the filling of micropores and the onset of capillary condensation; the value V_{micro} corresponds to the total volume of ultramicro- and supermicropores, that is, to the volume of micropores whose size is smaller than 20 Å.

³¹ V_{meso} (cm^3/g) = $V_L - V_{micro}$.

⁴¹ V_L (cm^3/g) is the volume of pores whose size is smaller than 5000 Å. It is calculated from the adsorption of nitrogen at $P/P_0 = 0.98$.

⁵¹ D_{mean} (Å) is the mean size of pores, calculated as $D_{mean} = 4 \cdot 10^4 \cdot V_L / A_{BET}$.

⁶ K (%) is the degree of crystallinity, calculated from the integral peak intensity (002); diffractograms were recorded on a HZG-4C diffractometer (CuK α , graphite monochromator).

(see page 11, table 1). This is identical with the claims.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Taylor Victor Oh whose telephone number is 571-272-0689. The examiner can normally be reached on 8:30-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Janet Andres can be reached on 571-272-0867. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Taylor Victor Oh, MSD, LAC
Primary Examiner
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10/9/09